

**PATENT COOPERATION TREATY**

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**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 2003-0352.02	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/US2004/024356	International filing date ( <i>day/month/year</i> ) 29 July 2004 (29.07.2004)	Priority date ( <i>day/month/year</i> ) 13 August 2003 (13.08.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant <b>LEXMARK INTERNATIONAL, INC.</b>			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report   |
| <input type="checkbox"/> Box No. II           | Priority  |
| <input type="checkbox"/> Box No. III          | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/> Box No. IV           | Lack of unity of invention  |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI           | Certain documents cited   |
| <input type="checkbox"/> Box No. VII          | Certain defects in the international application  |
| <input type="checkbox"/> Box No. VIII         | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

Date of issuance of this report 13 February 2006 (13.02.2006)	
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer  <b>Masashi Honda</b>  Telephone No. +41 22 338 70 10
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**PATENT COOPERATION TREATY**

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
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REC'D 25 APR 2005

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

21 APR 2005

**FOR FURTHER ACTION**

See paragraph 2 below

Applicant's or agent's file reference  2003-0352.02		Date of mailing (day/month/year)	
International application No.  PCT/US04/24356	International filing date (day/month/year)  29 July 2004 (29.07.2004)	Priority date (day/month/year)  13 August 2003 (13.08.2003)	
International Patent Classification (IPC) or both national classification and IPC  IPC(7): C09D 11/00 and US Cl.: 106/31.65			
Applicant  LEXMARK INTERNATIONAL, INC.			

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US04/24356

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- a sequence listing  
 table(s) related to the sequence listing

b. format of material

- in written format  
 in computer readable form

c. time of filing/furnishing

- contained in international application as filed.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US04/24356

**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)                      Claims 4, 6, 8, 10, 12, 14, 16, 18 YES  
                                      Claims 1-3, 5, 7, 9, 11, 13, 15, 17 NO

Inventive step (IS)              Claims NONE YES  
                                      Claims 1-18 NO

Industrial applicability (IA)    Claims 1-18 YES  
                                      Claims NONE NO

**2. Citations and explanations:**

Please See Continuation Sheet

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US04/24356

Supplemental Box  
In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

- Claims 1-3, 5, 7, 9, 11, 13, 15 and 17 lack Novelty under PCT Article 33(2) as being anticipated by or, in the alternative, under PCT Article 33(3) as obvious over Johnson et al (US Patent 6,277,183).

Johnson et al teach an ink composition comprising at least one ink vehicle, at least one pigment and at least one metal oxide wherein the colorant may be a dye or pigment wherein the composition may be used for ink jet printing (abstract and col. 3 lines 5-18). The ink vehicle may be an aqueous ink jet ink vehicle (col. 3 lines 50-51).

The pigment present in the ink composition may be selected from a conventional colored pigments such as white, blue, brown, cyan, green, magenta, red, yellow and mixtures thereof (col. 4 lines 56+). The reference further teaches that the pigment and metal oxide have the same charge which is preferably a negatively charged metal oxide with negatively charged pigment (col. 7 lines 36-44).

Any metal oxide, such as oxides of Zn (Zinc) and Zr (Zirconium), may be used in the ink composition as long as it is compatible with the other ink components (col. 7 lines 45-56). The colorant and metal oxide have a particle size of about 1 micron or less especially for ink jet ink particles (col. 8 lines 51-51) and any conventionally used particle size of the pigment can be used but it is preferred that the particle size is about 0.010 to about 1 micron (10 to 1000 nm) col. 5 lines 21-24). The amount of the metal oxide is present from 0.01 to 49.6 percent by weight (col. 9 lines 5-1 1). See example 16 specific amounts of metal oxide used in the range that is claimed by Applicant; See claims 1, 16, 23 27. The composition as taught by Johnson et al appears to anticipate the claimed invention when the metal oxide has a particle size of 200 nm or less, particularly 10 to 30 nm.

Alternatively, Johnson et al and the claims differ in that Johnson et al does not teach the exact same proportions as recited in the instant claims when the metal oxide particle size is in the range of 200 nm to 1000 nm (1 micron).

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the compositional proportions taught by Johnson et al overlap the

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

instantly claimed proportions and therefore are considered to establish a *prima facie* case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference.

Claims 4, 6, 8, 10, 12, 14, 16 and 18 lack Inventive Step under PCT Article 33(3) as being over Johnson et al (US Patent 6,277,183) as applied to claims 1-3, being obvious 5, 7, 9, 11, 13, 15 and 17 above, and further in view of Shimizu et al (US Patent 4,680,058).

Johnson et al is described above but fail to teach tin oxide.

Shimizu et al teach an ink composition which is used for ink jet printing (col. 2, lines 41-43). The reference further teaches that the colorant may be zinc white (zinc oxide), tin oxide and zirconium oxide (col. 2 lines 57-65).

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced zinc oxide or zirconium oxide with tin oxide because the substitution of art recognized equivalents as shown by Shimizu et al would have been within the level of ordinary skill in the art.

Claims 1-18 meet the criteria for PCT Article 33(4) thus having industrial applicability because the subject matter can be made or used in the industry.